



Mission: STS-78 on Columbia.

Launch date, time: June 20, 10:49 a.m. from Launch Pad 39B.

Primary Payload: Life and Microgravity Spacelab (LMS).

Mission Synopsis: During the nearly 16-day-long mission, the seven-member crew will conduct microgravity research experiments in the Life and Microgravity Spacelab module mounted in the payload bay. The majority of the life sciences experiments will be devoted to the study of the effects of microgravity on human physiology. The investigations will include specific studies on bone tissue loss, muscle performance and adaptation, caloric intake and energy expenditure, pulmonary function, neuro-vestibular adjustment and general studies on the effects of space flight on human performance and on daily sleep and biological (circadian) rhythms.

Landing date, time: July 6, 8:46 a.m. at the Shuttle Landing Facility.

Mission: STS-79 on Atlantis.

Launch date, time: July 31, 11:42 p.m. from Launch Pad 39A.

Primary Payload: 4th Mir docking, SPACEHAB.

Landing date, time: Aug. 9, 8:17 p.m. at the Shuttle Landing Facility.

Spaceport News

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John F. Kennedy Space Center

Rising with the sun



A FLAWLESS countdown culminates with an on-time liftoff as the Space Shuttle Endeavour lights up the morning sky May 19. Endeavour was launched on Mission STS-77 from Pad 39B at 6:30 a.m. EDT. The fourth Shuttle mission of 1996 is devoted to help open the commercial space frontier. During a post-launch press conference, Launch Integration Manager Loren Shriver commented on the "beautiful ascent" highlighted by the early morning lighting effects. STS-77 is scheduled to land at Kennedy Space Center's Shuttle Landing Facility on May 29 a little after 7 a.m. EDT.

Banquet celebrates Americans' 35 years in space

Thirty five years of human space flight were celebrated May 13 as hundreds of space supporters enjoyed a rare opportunity to see three of the original Mercury 7 astronauts together again.

Alan Shepard, Gordon Cooper and Scott Carpenter were the featured guests at a celebratory banquet sponsored by the Canaveral Press Club Veterans and the NASA/KSC Joint Industry Council.

Shepard led off the country's



MERCURY ASTRONAUTS, from the left, Gordon Cooper, Alan Shepard, and Scott Carpenter, were the featured guests at the banquet.

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Long, Hoffler honored at Aerospace Medical Association meeting

Dr. Irene Long and Dr. Wyck Hoffler, director and deputy director, KSC Biomedical Operations Office, were honored at the 67th Annual Scientific Meeting of the Aerospace Medical Association held in Atlanta recently.

Long was elected as the second vice president of the affiliated Society of NASA Flight Surgeons (SNFS) and will serve as the organization's president in 1998.

Hoffler received the SNFS President's award from this year's president, KSC's Dr. David Tipton, and was cited for his contribution to the ideals and goals of the society.

Hoffler also serves as the organization's historian.

Employees of the month



HONORED IN MAY, from the left are Lorene Williams, Shuttle Processing Directorate; Susan Sharp, Space Shuttle Program Office; Thomas Rucci, Payload Processing Directorate; Sharon White, Procurement Office; Armando Oliu, Logistics Operations Directorate; Phyllis Onken, Office of the Chief Financial Officer; Gerald Schumann, Safety and Mission Assurance Directorate; and Jeanine Hoyle, Administration Office. Not pictured is Joanne Maceo, Engineering Development Directorate.

Tiny sea animals help NASA, CSA answer big questions

NASA and the Canadian Space Agency (CSA) are taking life science research to new heights. CSA's Aquatic Research Facility (ARF) or Space Aquarium launched with the Space Shuttle Endeavour on May 19.

One thousand mussel larvae, 32,000 sea urchin eggs and 6,000 starfish embryos were stowed aboard Canada's first life science payload in space. This zoo of marine life is the focus of three studies that will address world-wide concerns ranging from birth defects to dwindling fish stocks in our oceans.

Housed in what looks like a suitcase carrying two carousels from a compact disc player, the aquatic specimens are being observed by two tiny videocameras in two separate environments. Kennedy Space Center (KSC) life science personnel will take part in the monitoring and maintenance of the experiments in-flight.

One carousel spins, imitating the Earth's gravity and the other provides a gravity-free environment so scientists can compare the two conditions side by side. A third set of specimens is being watched at KSC to insure that gravity is the only varying factor in the experiment.

Dr. Heide Schatten, a professor of zoology at the University of Wisconsin-Madison, is the principal investigator on the U.S. portion of the experiment. It began three hours after launch when astronauts injected a sperm concentrate into a container full of

sea urchin eggs using a unique KSC developed syringe.

The new syringe, made from off-the-shelf materials, allows very small, exact injections of fluid. It protects the user from needle injury and has a triple containment feature that prevents fluid from leaking in the near-zero gravity environment of space.

Dr. Schatten will observe the effects of spaceflight on the early stages of embryo development. The study will provide insight into the causes and cures of both osteoporosis and muscular dystrophy.

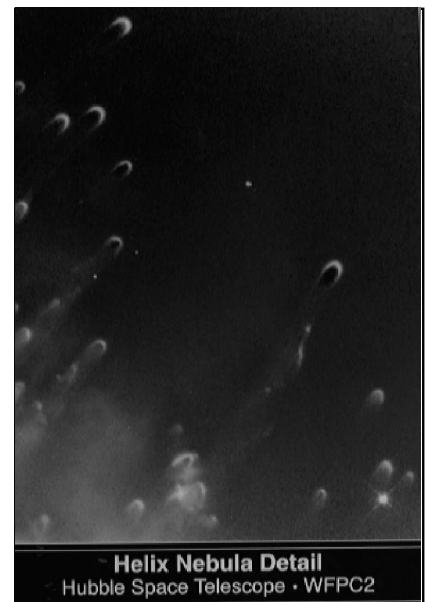
One of the two CSA experiments focuses on the calcium formation of a mussel's shell and the development of its feeding mechanism. Dr. Ron O'Dor, a professor at Dalhousie University in Nova Scotia, hopes his investigation will shed some light on the causes of calcium depletion experienced by humans in space.

Today's astronauts take daily, three-hour exercise breaks to maintain healthy bones and muscles in space. The results from this experiment apply directly to the planned long term stays on the International Space Station.

Another CSA experiment looks at the effects of zero gravity on the starfish embryo.

Both CSA experiments will help researchers understand how these small sea creatures contribute to the removal of greenhouse gases in the atmosphere.

COMETARY KNOTS



THESE gigantic, tadpole-shaped objects are probably the result of a dying star's last gasps. Dubbed "cometary knots" because their glowing heads and gossamer tails resemble comets, the gaseous objects probably were formed during a star's final stages of life. Hubble astronomer Robert O'Dell and graduate student Kerry Handron of Rice University in Houston, Texas, discovered thousands of these knots while exploring the Helix nebula, the closest nebula to Earth at 450 light-years away in the constellation Aquarius. Although ground-based telescopes have revealed such objects, astronomers have never seen so many of them.

Supersonic cleaning system offers uses beyond Space Shuttle

By Chuck Weirauch

A new supersonic cleaning system that does not damage surfaces has been developed by Kennedy Space Center engineers and may soon be used to remove contaminants from Space Shuttle hardware and other sensitive structures.

Because the Supersonic Gas-Liquid Cleaning System is so unique in its design and potential effectiveness, separate patent license agreements have been developed between KSC and two independent companies for commercial applications.

The companies are Precision Fabricating and Cleaning Co. of Cocoa, FL, and Va-tran Systems, Inc., of Chula Vista, CA. The agreement is a means for NASA to effectively transfer technology initially developed for the space program to companies that may derive innovative commercial uses from it.

One of the many advantages of the Supersonic Gas-Liquid Cleaning System over other pressurized cleaning methods is that it does not abrade the surface of the hardware being cleaned.

It requires much lower levels of pressure while using very little water.



I-NET, Inc. technician Chris Fogerty cleans a stainless steel gaseous oxygen valve with the Supersonic Gas-Liquid Cleaning System in the Engineering Support Building at Complex 34 on Cape Canaveral Air Station. The minute amounts of water used by the system are captured in the cleaning hood of the unit for analysis.

These features allow the system to be used for cleaning anything from small electronic circuit boards to much larger historic monuments and buildings.

"We don't need to use as high a pressure as in some cleaning systems," said Eric Thaxton, one of the system designers at KSC, "because the energy is provided by the nozzle's supersonic design."

The system works by mixing air and water from separate

pressurized tanks and ejecting this mixture at supersonic speeds from a series of nozzles at the end of a hand-held wand, explained NASA lead project engineer Raoul Caimi.

At these speeds, the water droplets have the kinetic energy to forcibly remove the contaminant material.

This technology also is environmentally friendly. It was developed as an alternative to chlorofluorocarbon (CFC)-

based solvents.

"During our testing programs," Caimi said, "we found that the gas-liquid supersonic system actually does a better job of cleaning than the system that uses CFCs."

Also, the relatively low volume of water required, less than 100 milliliters per minute, means there is less fluid left after cleaning that must be handled as contaminated industrial or hazardous waste.

Va-tran Systems director of engineering Jeffrey Sloan feels that the Kennedy invention will add an exciting technology to the company's current precision cleaning capabilities.

"We anticipate greatly expanded markets as we begin to serve automotive, aerospace, heavy manufacturing and other industries," he said.

Bill Sheehan, chief of KSC's Technology Programs and Commercialization Office, said, "This is an innovative system that is recognized by industry to have many potential uses in the commercial market. We feel that it serves as a good example of how technology developed for use in the space program can benefit the country's industry and the public."

KSC employees judge state science fair at UCF



MORE THAN 15 NASA employees went back to school last month to serve as judges for the state Science and Engineering Fair held at the University of Central Florida April 11 and 12. Pictured at left are judges, front row from left, Brian Graf, Cindy Martin, Sharon Walchessen, Carrie Cunningham, Lori Cernell, Tony Killiri,



Eva Farley, and Shirish Patel. Standing, from left, are Matt Galloway, Ron Milligan, John Godbold, Andy Wheeler, Doug Willard, and Bob Turner. In the photo at right, displays are seen from overhead. Students participated in the junior (grades 6-8) or senior (grades 9-12) divisions. NASA gave five award certificates in each division.